

WHAT IS CLAIMED IS:

1       1.     A battery terminal structure for connecting a terminal provided with an  
2     electric wire with a stud bolt type battery post, comprising:  
3                 an adapter, having a cylindrical body which is screwed onto the  
4     battery post, and a flange portion formed on a top portion of the cylindrical  
5     body to be clamped by a screwing tool;  
6                 a terminal body, including a substantially U-shaped adaptor fitting  
7     portion which accommodates the adapter screwed on the battery post therein,  
8     and a seat portion on which the electric wire terminal is fixed; and  
9                 a lever, including a cam portion and supported on the terminal body  
10    so as to be pivotable between a first position and a second position,  
11                 wherein a space in which the flange portion is capable of passing  
12    through is secured inside of the adaptor fitting portion when the lever is in the  
13    first position;  
14                 wherein the cam portion is abutted against an outer periphery of the  
15    cylindrical body of the adaptor so that the adaptor is retained between the cam  
16    portion and an inner face of the adaptor fitting portion, when the lever is in the  
17    second position; and  
18                 wherein the flange portion of the adaptor is engaged with a top end  
19    face of the adapter fitting portion of the terminal body.

1       2.     The battery terminal structure as set forth in claim 1, wherein the  
2     flange portion of the adaptor has a hexagonal shape such that a dimension  
3     between opposite faces is at least identical with an outer diameter of the

4 cylindrical body of the adaptor.

1       3.     The battery terminal structure as set forth in claim 1, further  
2 comprising an engagement member, which provisionally retains the lever in at  
3 least one of the first position and the second position.

1       4.     The battery terminal structure as set forth in claim 1, further  
2 comprising an elastic member provided in either one of the lever or the  
3 terminal body for bringing the cam portion into an elastic contact with the  
4 adaptor.

1       5.     The battery terminal structure as set forth in claim 1, wherein the  
2 terminal body is made of a single metal plate.

1       6.     The battery terminal structure as set forth in claim 1, wherein a  
2 dimension between an outer side faces of the adaptor fitting portion is equal to  
3 a dimension between an outer side faces of the terminal body where the seat  
4 portion is provided.

1       7.     The battery terminal structure as set forth in claim 1, wherein the  
2 electric wire terminal is fixed on the seat portion with a stud bolt and a nut; and  
3 wherein the lever includes a through hole which accommodates the  
4 nut therein when the lever is in the second position.

1       8.     A battery terminal structure for connecting a terminal provided with an  
2     electric wire with a stud bolt type battery post, comprising:

3              an adapter, having a cylindrical body which is screwed onto the  
4     battery post, and a flange portion formed on the cylindrical body to be clamped  
5     by a screwing tool;

6              a terminal body, including a substantially U-shaped adaptor fitting  
7     portion which accommodates the adapter screwed on the battery post therein,  
8     and a seat portion on which the electric wire terminal is fixed;

9              a lever, including a cam portion and supported on the terminal body  
10    so as to be pivotable between a first position and a second position; and

11              an engagement member, which provisionally retains the lever in at  
12    least one of the first position and the second position,

13              wherein a space in which the flange portion is capable of passing  
14    through is secured inside of the adaptor fitting portion when the lever is in the  
15    first position; and

16              wherein the cam portion is abutted against an outer periphery of the  
17    cylindrical body of the adaptor so that the adaptor is retained between the cam  
18    portion and an inner face of the adaptor fitting portion, when the lever is in the  
19    second position.

1       9.     The battery terminal structure as set forth in claim 8, wherein the  
2     engagement member includes a recessed portion formed on one of the  
3     terminal body and the lever, and a convex portion engaged with the recessed  
4     portion formed on the other of the terminal body and the lever.

1       10.     The battery terminal structure as set forth in claim 8, wherein a flange  
2 portion is formed on a top portion of the cylindrical body of the adaptor; and  
3               wherein the flange portion is engaged with a top end face of the  
4 adaptor fitting portion of the terminal body.

1       11.     The battery terminal structure as set forth in claim 8, further  
2 comprising an elastic member provided in either one of the lever or the  
3 terminal body for bringing the cam portion into an elastic contact with the  
4 adaptor.

1       12.     The battery terminal structure as set forth in claim 8, wherein the  
2 terminal body is made of a single metal plate.

1       13.     The battery terminal structure as set forth in claim 8, wherein a  
2 dimension between an outer side faces of the adaptor fitting portion is equal to  
3 a dimension between an outer side faces of the terminal body where the seat  
4 portion is provided.

1       14.     The battery terminal structure as set forth in claim 8, wherein the  
2 electric wire terminal is fixed on the seat portion with a stud bolt and a nut; and  
3               wherein the lever includes a through hole which accommodates the  
4 nut therein when the lever is in the second position.

1       15.     A battery terminal structure for connecting a terminal provided with an  
2 electric wire with a stud bolt type battery post, comprising:

3               an adapter, having a cylindrical body which is screwed onto the  
4       battery post, and a flange portion formed on the cylindrical body to be clamped  
5       by a screwing tool;

6               a terminal body, including a substantially U-shaped adaptor fitting  
7       portion which accommodates the adapter screwed on the battery post therein,  
8       and a seat portion on which the electric wire terminal is fixed;

9               a lever, including a cam portion and supported on the terminal body  
10      so as to be pivotable between a first position and a second position; and

11               an elastic member provided in either one of the lever or the terminal  
12      body for bringing the cam portion into an elastic contact with the adaptor,

13               wherein a space in which the flange portion is capable of passing  
14      through is secured inside of the adaptor fitting portion when the lever is in the  
15      first position; and

16               wherein the cam portion is abutted against an outer periphery of the  
17      cylindrical body of the adaptor so that the adaptor is retained between the cam  
18      portion and an inner face of the adaptor fitting portion, when the lever is in the  
19      second position.

1       16.       The battery terminal structure as set forth in claim 15, wherein the  
2       elastic member is a plate spring which constitutes the cam portion of the lever.

1       17.       The battery terminal structure as set forth in claim 16, wherein the  
2       plate spring is extended along an outer periphery of the cam portion such that  
3       a first end portion of the plate spring is fixed on the lever member and a  
4       second end portion of the plate spring is movable retained at the cam portion.

1       18.     The battery terminal structure as set forth in claim 15, wherein a  
2     flange portion is formed on a top portion of the cylindrical body of the adaptor;  
3     and

4               wherein the flange portion is engaged with a top end face of the  
5     adaptor fitting portion of the terminal body.

1       19.     The battery terminal structure as set forth in claim 15, further  
2     comprising an engagement member, which provisionally retains the lever in at  
3     least one of the first position and the second position.

1       20.     The battery terminal structure as set forth in claim 15, wherein the  
2     terminal body is made of a single metal plate.

1       21.     The battery terminal structure as set forth in claim 15, wherein a  
2     dimension between an outer side faces of the adaptor fitting portion is equal to  
3     a dimension between an outer side faces of the terminal body where the seat  
4     portion is provided.

1       22.     The battery terminal structure as set forth in claim 15, wherein the  
2     electric wire terminal is fixed on the seat portion with a stud bolt and a nut; and  
3               wherein the lever includes a through hole which accommodates the  
4     nut therein when the lever is in the second position.

1       23.     A battery terminal structure for connecting a terminal provided with an  
2     electric wire with a stud bolt type battery post, comprising:  
3                 an adapter, having a cylindrical body which is screwed onto the  
4     battery post, and a flange portion formed on the cylindrical body to be clamped  
5     by a screwing tool;  
6                 a terminal body, including a substantially U-shaped adaptor fitting  
7     portion which accommodates the adapter screwed on the battery post therein,  
8     and a seat portion on which the electric wire terminal is fixed; and  
9                 a lever, including a cam portion and supported on the terminal body  
10    so as to be pivotable between a first position and a second position,  
11                 wherein a space in which the flange portion is capable of passing  
12    through is secured inside of the adaptor fitting portion when the lever is in the  
13    first position;  
14                 wherein the cam portion is abutted against an outer periphery of the  
15    cylindrical body of the adaptor so that the adaptor is retained between the cam  
16    portion and an inner face of the adaptor fitting portion, when the lever is in the  
17    second position;  
18                 wherein the terminal body is made of a single metal plate including a  
19    first portion which is bent in a thickness direction thereof to form the adaptor  
20    fitting portion, a second portion extended perpendicularly from a first end of the  
21    first portion, and a third portion extended perpendicularly from a second end of  
22    the first portion; and  
23                 wherein the second and third portions are bent so as to be  
24    overlapped with each other to form the seat portion.

1       24.     The battery terminal as set forth in claim 23, wherein the electric wire  
2     terminal is fixed on the seat portion with a stud bolt inserted through a through  
3     hole formed in the seat portion and a nut screwed onto the stud bolt.

1       25.     The battery terminal as set forth in claim 24, wherein a retaining piece  
2     is integrally formed on either one of the second and third portions of the metal  
3     plate; and

4                 wherein the retaining piece is bent to form a retaining member which  
5     retains a head portion of the stud bolt.

1       26.     The battery terminal structure as set forth in claim 23, wherein a  
2     flange portion is formed on a top portion of the cylindrical body of the adaptor;  
3     and

4                 wherein the flange portion is engaged with a top end face of the  
5     adaptor fitting portion of the terminal body.

1       27.     The battery terminal structure as set forth in claim 15, further  
2     comprising an engagement member, which provisionally retains the lever in at  
3     least one of the first position and the second position.

1       28.     The battery terminal structure as set forth in claim 23, further  
2     comprising an elastic member provided in either one of the lever or the  
3     terminal body for bringing the cam portion into an elastic contact with the  
4     adaptor.

1       29.     The battery terminal structure as set forth in claim 23, wherein a  
2 dimension between an outer side faces of the adaptor fitting portion is equal to  
3 a dimension between an outer side faces of the terminal body where the seat  
4 portion is provided.

1       30.     The battery terminal structure as set forth in claim 24, wherein the  
2 lever includes a through hole which accommodates the nut therein when the  
3 lever is in the second position.

1       31.     A battery terminal structure for connecting a terminal provided with an  
2 electric wire with a stud bolt type battery post, comprising:

3                 an adapter, having a cylindrical body which is screwed onto the  
4 battery post, and a flange portion formed on the cylindrical body to be clamped  
5 by a screwing tool;

6                 a terminal body, including a substantially U-shaped adaptor fitting  
7 portion which accommodates the adapter screwed on the battery post therein,  
8 and a seat portion on which the electric wire terminal is fixed; and

9                 a lever, including a cam portion and supported on the terminal body  
10 so as to be pivotable between a first position and a second position,

11                 wherein a space in which the flange portion is capable of passing  
12 through is secured inside of the adaptor fitting portion when the lever is in the  
13 first position;

14                 wherein the cam portion is abutted against an outer periphery of the  
15 cylindrical body of the adaptor so that the adaptor is retained between the cam  
16 portion and an inner face of the adaptor fitting portion, when the lever is in the

17 second position; and  
18 wherein a dimension between an outer side faces of the adaptor  
19 fitting portion is equal to a dimension between an outer side faces of the  
20 terminal body where the seat portion is provided.

1 32. The battery terminal structure as set forth in claim 31, wherein a  
2 flange portion is formed on a top portion of the cylindrical body of the adaptor;  
3 and

4 wherein the flange portion is engaged with a top end face of the  
5 adaptor fitting portion of the terminal body.

1 33. The battery terminal structure as set forth in claim 31, further  
2 comprising an engagement member, which provisionally retains the lever in at  
3 least one of the first position and the second position.

1 34. The battery terminal structure as set forth in claim 31, further  
2 comprising an elastic member provided in either one of the lever or the  
3 terminal body for bringing the cam portion into an elastic contact with the  
4 adaptor.

1 35. The battery terminal structure as set forth in claim 31, wherein the  
2 terminal body is made of a single metal plate.

1 36. The battery terminal structure as set forth in claim 31, wherein the  
2 electric wire terminal is fixed on the seat portion with a stud bolt and a nut; and

3               wherein the lever includes a through hole which accommodates the  
4       nut therein when the lever is in the second position.

1       37.      A battery terminal structure for connecting a terminal provided with an  
2       electric wire with a stud bolt type battery post, comprising:

3               an adapter, having a cylindrical body which is screwed onto the  
4       battery post, and a flange portion formed on the cylindrical body to be clamped  
5       by a screwing tool;

6               a terminal body, including a substantially U-shaped adaptor fitting  
7       portion which accommodates the adapter screwed on the battery post therein,  
8       and a seat portion on which the electric wire terminal is fixed; and

9               a lever, including a cam portion and supported on the terminal body  
10      so as to be pivotable between a first position and a second position,

11               wherein a space in which the flange portion is capable of passing  
12      through is secured inside of the adaptor fitting portion when the lever is in the  
13      first position;

14               wherein the cam portion is abutted against an outer periphery of the  
15      cylindrical body of the adaptor so that the adaptor is retained between the cam  
16      portion and an inner face of the adaptor fitting portion, when the lever is in the  
17      second position;

18               wherein the electric wire terminal is fixed on the seat portion with a  
19      stud bolt inserted through a through hole formed in the seat portion and a nut  
20      screwed onto the stud bolt; and

21               wherein the lever includes a through hole which accommodates the  
22       nut therein when the lever is in the second position.

1       38.     The battery terminal structure as set forth in claim 37, wherein a  
2 flange portion is formed on a top portion of the cylindrical body of the adaptor;  
3 and

4               wherein the flange portion is engaged with a top end face of the  
5 adaptor fitting portion of the terminal body.

1       39.     The battery terminal structure as set forth in claim 37, further  
2 comprising an engagement member, which provisionally retains the lever in at  
3 least one of the first position and the second position.

1       40.     The battery terminal structure as set forth in claim 37, further  
2 comprising an elastic member provided in either one of the lever or the  
3 terminal body for bringing the cam portion into an elastic contact with the  
4 adaptor.

1       41.     The battery terminal structure as set forth in claim 37, wherein the  
2 terminal body is made of a single metal plate.

1       42.     The battery terminal structure as set forth in claim 37, wherein a  
2 dimension between an outer side faces of the adaptor fitting portion is equal to  
3 a dimension between an outer side faces of the terminal body where the seat  
4 portion is provided.

1       43. An adaptor attached a stud bolt type battery post and fitted with a  
2       battery terminal, comprising:

3                 a cylindrical body which is screwed onto the battery post; and

4                 a flange portion formed on a top portion of the cylindrical body to be  
5       clamped by a screwing tool,

6                 wherein the flange portion is engaged with a top end face of the  
7       battery terminal.

1       44. The adaptor as set forth in claim 43, wherein the flange portion has a  
2       hexagonal shape such that a dimension between opposite faces is at least  
3       identical with an outer diameter of the cylindrical body.

1       45. A method of manufacturing a battery terminal which connects a  
2       terminal provided with an electric wire and a stud bolt type battery post,  
3       comprising the steps of:

4                 providing a single metal plate including a first portion, a second  
5       portion extended perpendicularly from a first end of the first portion, and a third  
6       portion extended perpendicularly from a second end of the first portion;

7                 bending the first portion into a substantially U-shape in a thickness  
8       direction thereof to form an adaptor fitting portion which accommodates an  
9       adaptor screwed onto the battery post therein; and

10                 bending the second and third portions so as to be overlapped with  
11       each other to form a seat portion on which the electric wire is fixed.